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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/627,890	07/24/2003	Mitsuru Kano	9281-4610	3821
7590	10/28/2004			
EXAMINER				
SCHECHTER, ANDREW M				
ART UNIT			PAPER NUMBER	
2871				

DATE MAILED: 10/28/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

10/627,890

**Applicant(s)**

KANO ET AL.

**Examiner**

Andrew Schechter

**Art Unit**

2871

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 23 December 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
  - 2) ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>12/23/03, 7/24/03</u> . | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Specification*

1. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: "Active matrix display device with reflecting layer with asymmetrical reflection properties".

### *Claim Rejections - 35 USC § 112*

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 8-11 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Claims 8-11 appear to be directed to embodiments other than that recited by the amended claim 1, with the result that their limitations contradict those of claim 1.

Claim 1 recites that the pixel electrodes are provided on the substrate closer to the viewer side, and the switching elements are provided for driving the pixel electrodes in the vicinity of the pixel electrodes. Dependent claim 8 further recites that the

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switching elements are on the substrate more distant from the viewer side. Either the switching elements are on the opposite substrate from the pixel electrodes they drive (which is not enabled by the specification) or the dependent claim simply contradicts the independent claim regarding which substrate the switching elements are on. Claim 8 is therefore rejected.

Claim 1 recites that the reflecting layer is on the substrate more distant from the view side and the pixel electrode is on the substrate closer to the viewer side.

Dependent claim 9 recites that the pixel electrodes double as the reflecting layer, which contradicts the limitations of the independent claim. Claims 9-11 are therefore rejected.

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claim 2 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 2 recites "whose phase ... has asymmetrical curvatures". This is unclear. What is meant by "phase" in this context? For examining purpose, it is assumed that "shape" is meant instead.

### ***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1-3, 5, 7, 12, and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Yoshii et al.*, U.S. 2002/0030774 in view of *Grupp*, U.S. Patent No. 4,904,060.

*Yoshii* discloses [see Fig. 6, etc.] an active matrix display device comprising a pair of substrates [11, 24], with one substrate [24] closer to the viewer side and one substrate [11] more distant from the viewer side; an optical modulation layer [30] lying between them; one of a reflective or transfective reflecting layer [1] formed on the one substrate [11] more distant from the viewer side, wherein the reflecting layer [1] has asymmetrical reflection properties [see Fig. 7].

*Yoshii* does not disclose explicitly that there are a plurality of pixel electrodes provided on the one of the substrates closer to the viewer side and switching elements for driving the respective pixel electrodes, provided in the vicinity of the pixel electrodes. *Yoshii* does disclose [paragraph 0084] an active matrix mode using thin-film transistors or diodes (switching elements), but does not disclose on which substrate they would be.

*Grupp* does disclose [see Fig. 2] for an analogous LCD, a plurality of pixel electrodes [5] provided on the one of the substrates closer to the viewer side and switching elements [col. 4, lines 40-57] for driving the respective pixel electrodes, provided in the vicinity of the pixel electrodes. It would have been obvious to one of ordinary skill in the art at the time of the invention to place the pixel electrodes and the switching elements on the opposite substrate from the reflecting layer, motivated by

*Grupp*'s teaching that it is a manufacturing advantage to be forming the switching elements and pixel electrodes on a surface which is planar rather than rough [col. 6, lines 13-23] and this allows greater freedom of choice in the characteristics of the reflector-diffuser, which can increase the brilliance of the cell [col. 7, lines 20-25]. Claim 1 is therefore unpatentable.

*Yoshii* discloses [see Figs. 1-5] that a cross section of the reflection layer has a corrugated surface whose shape from a light-entering direction to a light-receiving direction has asymmetrical curvatures with respect to a normal to the substrate, so claim 2 is also unpatentable. There is [see Fig. 8] an insulating layer [33] underlying the reflecting layer [35], the insulating layer provided with a corrugated surface, to form the corrugated surface of the insulating layer. *Yoshii* may or may not disclose that the corrugated surface is made by stamping; this is a product-by-process limitation, so that the claim is only limited to the structure implied by the steps [see MPEP 2113], and the structure is the same with or without the step of stamping. Claim 13 is therefore unpatentable as well. As can be seen clearly in Figs. 2 and 9, a curve of a cross section of the reflecting layer comprises two curves having different curvatures from each other, so claim 3 is also unpatentable. *Yoshii* discloses [paragraph 0084] the switching elements being thin film transistors or thin-film diodes (nonlinear two-terminal elements), so claims 5 and 12 are also unpatentable. *Yoshii* discloses a color filter [14] on the substrate farther from the viewer side, so claim 7 is also unpatentable.

8. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over *Yoshii et al.*, U.S. 2002/0030774 in view of *Grupp*, U.S. Patent No. 4,904,060, and further in view of *Takatsuka*, U.S. Patent No. 6,421,106.

*Yoshii* does not disclose that a maximum tilt angle of the curvatures is 30°. Instead, *Yoshii* discloses [paragraphs 0021-0022] that the tilt angle is preferably between 4° and 35° in view of the observers' normal viewing angle toward the display surface of the LCD (so the maximum tilt angle is 35° rather than 30°). *Takatsuka* discloses [col. 3, lines 45-60], for analogous divots in an analogous reflector, that the maximum tilt angle should be 18°, teaching that for larger angles the angle of divergence of reflected light increases excessively and the reflection intensity drops, leading to unsatisfactory brightness. It would have been obvious to one of ordinary skill in the art at the time of the invention to use a maximum tilt angle below 30°, motivated by this teaching of *Takatsuka*. Also, from the discussion of *Takatsuka*, it is clear that the maximum tilt angle is a result-effective variable (affecting the brightness, reflectivity, and divergence of reflected light) whose optimization would be obvious to one of ordinary skill in the art at the time of the invention. Claim 4 is therefore unpatentable.

9. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over *Yoshii et al.*, U.S. 2002/0030774 in view of *Grupp*, U.S. Patent No. 4,904,060, and further in view of *Yamazaki et al.*, U.S. Patent No. 6,362,866.

*Yoshii* and *Grupp* are silent on the structure of the TFTs. *Yamazaki* discloses an inverted-staggered shape for TFTs. It would have been obvious to one of ordinary skill in the art at the time of the invention to use an inverted-staggered shape for the TFTs,

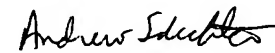
motivated by *Yamazaki's* teaching that the number of masks is small and the mass production performance is excellent for such a structure [col. 7, lines 55-59]. Claim 6 is therefore unpatentable.

### **Conclusion**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew Schechter whose telephone number is (571) 272-2302. The examiner can normally be reached on Monday - Friday, 9:00 - 5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert H. Kim can be reached on (571) 272-2293. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Andrew Schechter  
Patent Examiner  
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26 October 2004